2. Into the composition of these parts no capillaries, vasa vasorum, lymphatics, nor nerves are found to enter.

3. Hence, in human anatomy, we have these organs, forming a large mass, weighing on an average about two pounds, presenting a type of structure resembling that of some of the inferior zoophytes. And,

4. The human mother and her child, two of the most highly-organized beings in existence, are thus temporarily united together, during the intra-uterine life of the latter, by structures of the lowest zoological type.

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5. *On the Relative and Special Application of Fat and Sugar as Respiratory Food.*—Dr. T. HAYDEN read an interesting paper on this subject before the British Association for the Advancement of Science at its late meeting.

Dr. H. stated that "the classification of food under the two heads of 'calorifacient,' or heat-producing, and 'nutritive,' or tissue-forming, is now universally admitted by physiologists. The distinction is an important one, and founded upon the cycle of changes which carbonaceous and nitrogenous aliments respectively undergo in the construction, growth, and disintegration of animal bodies. Whilst, however, it is found that the nutrient or nitrogenous substances are all presented by nature's Great Author under the form of albumen, or the allied substances, gluten, caseine, or fibrine, and, in the complex process of digestion, after undergoing the preparatory change of conversion in the stomach, are directly received into the circulation. Fat, under any of these various forms, never so enters, being transmitted through the lacteal system of vessels and glands, but, after admixture with the lymph, is received into the general circulation, under the modified form of an emulsion. The salient points of contrast thus observable in the constitution of fat and sugar, as well as the remarkable divergence in the preliminary stages of their digestion, the preparatory processes to which they are respectively subjected, and the different channels by which they enter the circulation, must indicate some difference in the mode of their application to the great purpose for which they are both destined, the maintenance of animal heat. I believe these two substances possess different values as food; that they undergo different transformations, and during these transformations subserve distinct purposes of economy; that the period of their retention in the body is the same; that they are not mutually convertible; but that ultimately they pass out of the body under the common form of carbonic acid and water, and are jointly concerned in the production of animal heat. In the physiological state, oleaginous alimentary substances are always in the first instance assimilated, and occupy cells, whether of the adipose tissue or of the liver. In this summary I do not include the azotized fat of the nerves and nerve-centres named 'cerebrine,' which belongs to a higher order. As adipose tissue, fat gives rotundity of form in moderate proportion, and beauty of configuration to the body; it serves as a soft and elastic nidus for delicate organs, as the eye and the kidney, and in relation to the former assists passively by its compressibility and resiliency in accommodating the organ to the vision of objects at different distances under the combined action of the recti and obliqui muscles. Finally, fat, as adipose tissue, enveloping the body, as it were, in a natural mantle, prevents rapid refrigeration, in virtue of its property as a bad conductor of heat. Thus it will be seen, that, in the form of deposited fat, oleaginous food serves a variety of subsidiary, but still useful purposes in the animal body, independently of its great end of ministering to the supply of animal heat. It is universally admitted that it is necessary to the due performance of the various functions of the body that the vital stimulus of heat be maintained at the physiological standard; certain functions are termed vital, because the suspension of them beyond a very brief period, is followed by death Such are respiration and the circulation of the blood, to select such a familiar example. In the instance of both these important functions, the fatal consequences which must ensue from temporary interruption are amply provided against. The reserve and residual air in the lungs will sustain life, or rather render it possible to resuscitate the animal for several minutes after respiration has ceased, whereas, if these volumes of air have been expelled from the lungs by a heavier fluid, such as water, immediate death ensues, as shown by the Committee of this Association, appointed to investigate the subject of suspended respiration. Interruption to the supply or return of blood through one or more vessels is compensated for by the establishment of a collateral circulation. In a similar manner provision is made, in the fat deposited in the body, for the maintenance of animal heat during a certain period, under circumstances of total deprivation of heat producing food; but before deposited fat can become available for this purpose, it must undergo disintegration or disassimilation, and be reabsorbed into the blood. I would not be understood as denying that the adipose, like other tissues of the body, is constantly undergoing that process of gradual molecular destruction, or textural change, which is inseparable from living organized substance, and constitutes the principal condition of its existence. What I desire to convey is, that fat, being an assimilable substance, must be always in the first instance assimilated, and can, under no circumstances, be applied to the maintenance of animal heat before undergoing the twofold process of constructive and destructive assimilation. Amylosaccharine substances are immediately and directly passed off from the blood, and are never assimilated in the proper acceptation of the term. Of the starch taken in as food, however, a certain proportion escapes the converting action of the saliva, and is deposited in the liver, probably in the hepatic cells, whence it is drawn to supply heat when the amount of sugar in the food recently taken happens to be insufficient, or when the body is exposed to highly refrigerating influences." After describing some experiments of his own, Dr. Hayden continued—"The conclusions at which I have arrived, however, from the observations I have been able to make up to the present, may be stated as follows: The amount of fat deposited in the body is regulated by the absolute and relative quantity of oleaginous and saccharine matter in the food taken; both substances taken in a large quantity cause excessive deposits of fat. If the fat taken be in defect, even though the sugar be in excess, no increase in the deposit of fat takes place, but rather a decrease, obviously in consequence of ordinary molecular absorption, to which the adipose, in common with other tissues, is subject, not being counterbalanced by assimilation. If the fat taken be in excess, whilst the sugar is insufficient to meet the immediate wants of the respiratory function, still the deposit of fat may not undergo increase, but the contrary, apparently because a portion of that already deposited must undergo reabsorption into the blood for the purpose of supplying heat. Fat is, therefore, as a heat-producing substance, only supplemental of sugar, which is the ordinary pabulum of respiration. Saliva, like gastric juice, is secreted in quantity strictly proportioned to the immediate wants of the system, and quite irrespectively of the absolute quantity of food taken: a certain proportion of the starch of the food, varying according to the quantity taken and the necessity of respiration, escapes the converting action of the saliva, and is stored up in the liver. This liver-starch is being taken constantly back into the blood to supplement the respiratory elements of the food, and in the blood is converted into sugar, probably next into lactic, and finally into carbonic acid. Hence the presence of sugar, normally, in small proportion, in the blood of the right side of the heart; hence, likewise, its presence in the right side of the heart of animals fed exclusively upon meat, in whose portal blood not a trace of sugar is discoverable."—*Med. Times and Gaz.*, Oct. 1, 1864.

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6. *Physiological Effects of Tobacco.*—Dr. B. W. Richardson communicated to the Physiological Section of the British Association for the advancement of science the results of his inquiries into the physiological effects of tobacco on the human system. Dr. R. is himself said to be a moderate smoker, and he entered upon his investigations without prejudice, and his results must therefore be received with the greater confidence.

The following is a summary of his views:—

"1. The effects that result from smoking are due to different agents imbibed by the smoker, viz., carbonic acid, ammonia, nicotine, a volatile empyreumatic substance, and a bitter extract. The more common effects are traceable to the carbonic acid and ammonia; the rarer and more severe to the nicotine, the empyreumatic substance, and the extract. 2. The effects produced are very transitory, the poisons finding a ready exit from the body. 3. All the evils of smok-